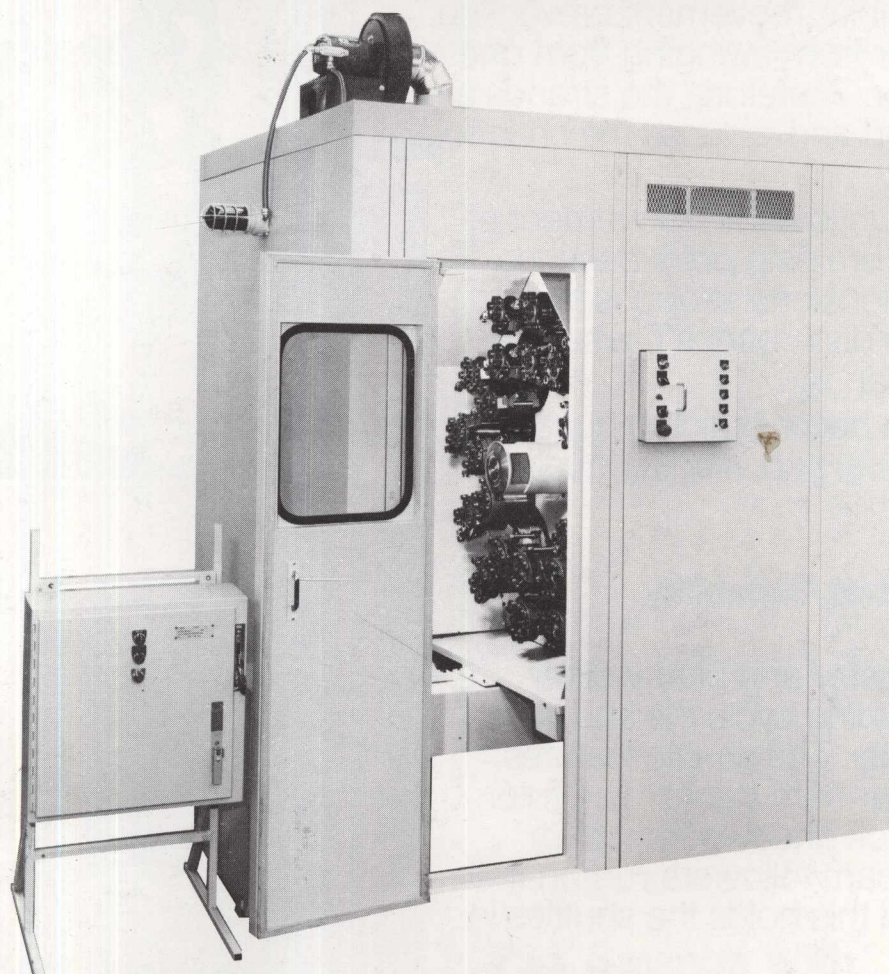


MR-11 BRAIDMATIC®



Mayer, Rothkopf Industries, Inc.

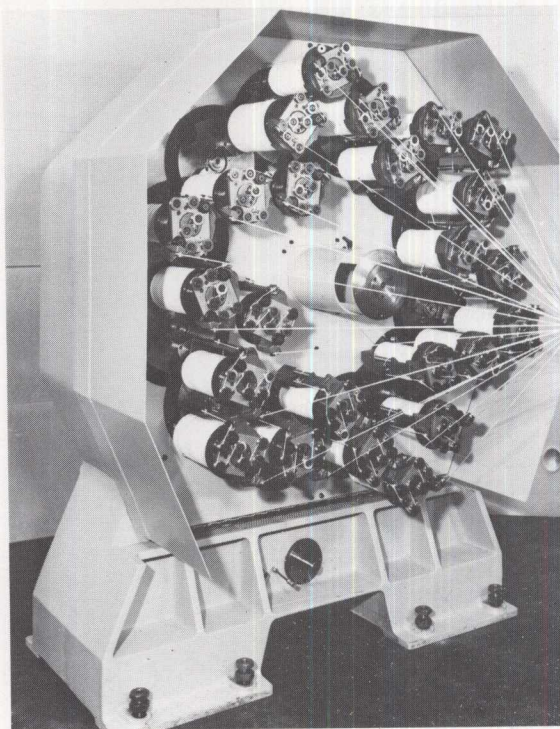
What Makes The MR-11 Braidmatic® So Different?

Elimination Of Angular Acceleration

The wire or yarn strand points directly at the hose coming from the carrier pay off roller at any position during inward and outward cycle. Planetary gears compensate for the angular movement preventing the pay off roller from swinging from one side to the other. Therefore, the strands are positively guided and reduces the chance of cross over.

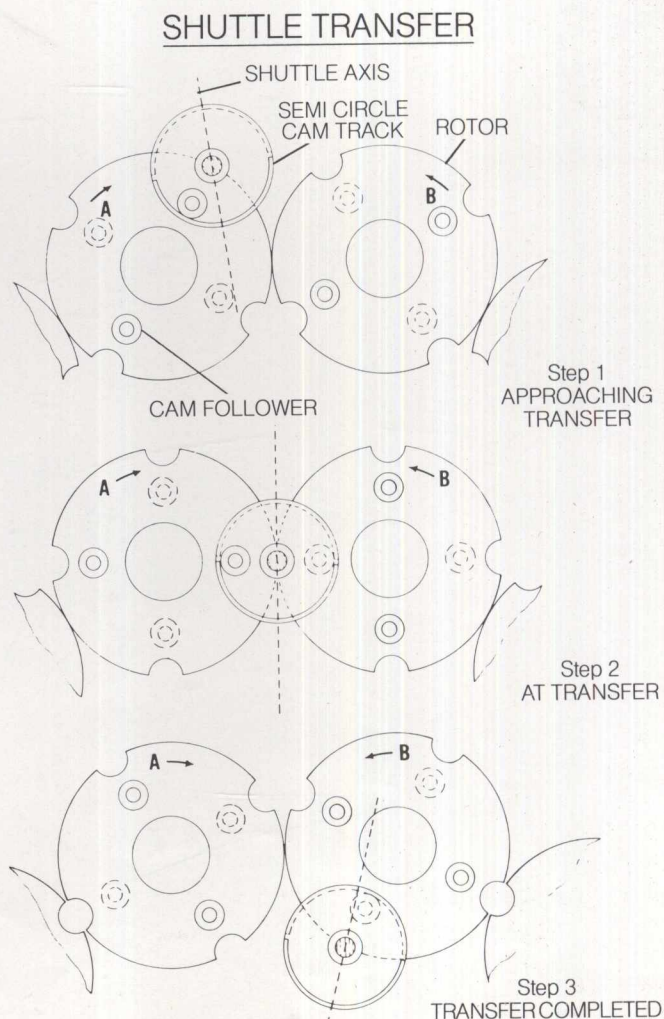
You can see practically no movement of the hose at the braiding point because we have equal tensions at opposite carriers and no disturbance caused by swinging of strands.

This results in a better braiding quality for any given material and winding quality.



Improved Transfer Capability

During the transfer and at any other point of the braiding cycle the shuttle is guided **positively**. The shuttle features two semi circular cam tracks. The rotor features two back and two front cam followers. The cam followers run on the cam tracks and this holds the shuttles in their position.



MR-11 Braidmatic®

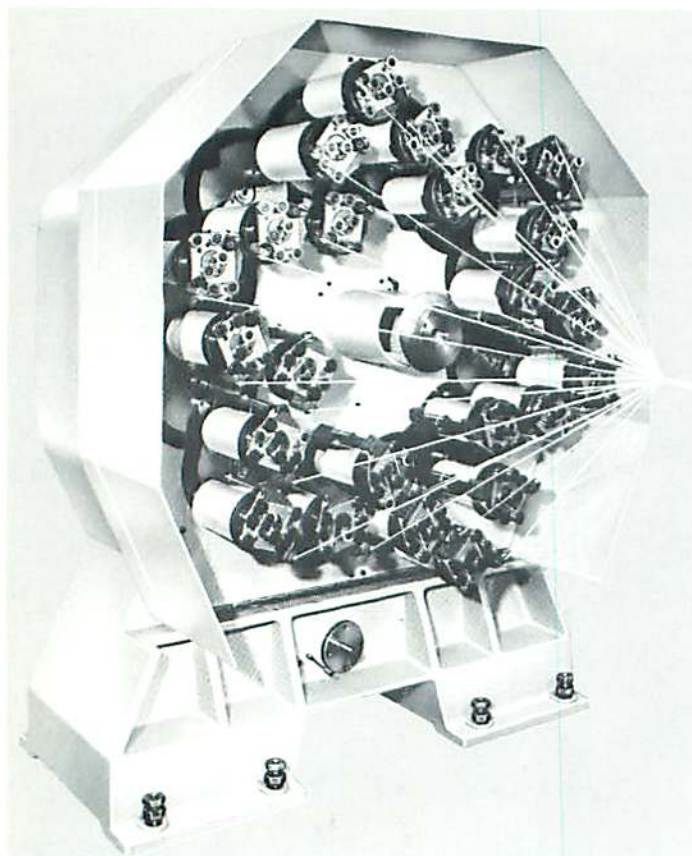
MR
Mayer Rothkopf Industries, Inc.

Basle 5/80



Gleichmäßige
Klöppelbewegung
gibt
gleichmäßiges
Flechtbild

Die Differenz zu anderen: die intelligentere Klöppelführung



Keine ruckartige Beschleunigung der Klöppel

Ein Planetengetriebe steuert die Bewegungen der Klöppelköpfe. Ruckartige Beschleunigungen sind dadurch ausgeschlossen. Garne oder Drähte sind in jeder Position positiv geführt. Unbeabsichtigtes Überkreuzen ist ausgeschlossen.

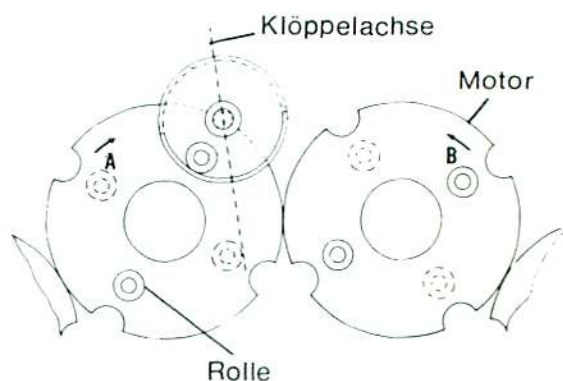
Die von den Klöppeln auslaufenden Garne oder Drähte zeigen stets direkt auf den Flechtpunkt.

Die Garnspannung an den gegenüberliegenden Klöppelköpfen ist stets identisch. Bewegungen des Schlauches am Flechtpunkt sind kaum feststellbar. Auch hieraus ergeben sich die hohe Betriebssicherheit und das gleichmäßige Flechtbild.

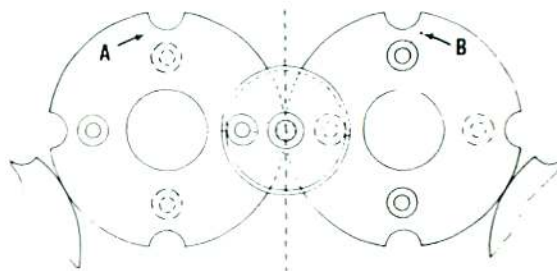
Bessere Transfer-Funktion

Im Transfer-Vorgang und in jeder anderen Bewegungsposition werden alle Klöppel positiv geführt. Jeder Rotor trägt zwei hintere und zwei vordere Transfer-Lagerrollen, die in die Führungsschienen der Klöppel eingreifen.

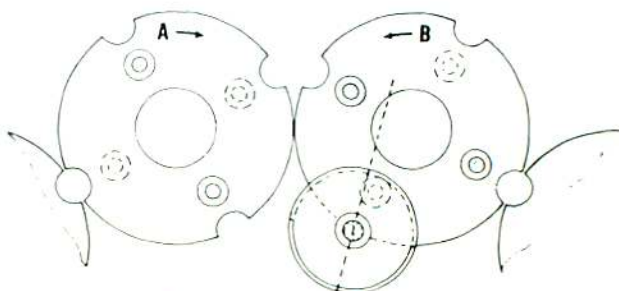
Klöppel-Transfer



Pos.1: Vor Transfer



Pos.2: Im Transfer



Pos.3: Nach Transfer

Beste Voraussetzungen
für optimale Wirtschaftlichkeit
und schnelle Amortisation

Rollenlager unterstützen Positiv-Führung

Die Positiv-Führung der Klöppel und die Rollenlagerung aller rotierenden Teile ergeben zusammen eine langfristige Betriebssicherheit. Leichter Lauf und gleichmäßige Geschwindigkeiten sichern hohe Lebensdauer für alle Teile und geringen Energieverbrauch.



Reduzierte Spannungsdifferenzen

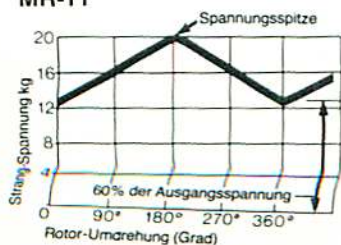
Konventionelle Systeme produzieren große Spannungsdifferenzen innerhalb einer Rotorumdrehung.

Die MR-11 Braidmatic gleicht Spannungsdifferenzen automatisch weitgehend aus. Das Flechtbild wird entsprechend gleichmäßiger, der Flechtvorgang sicherer.

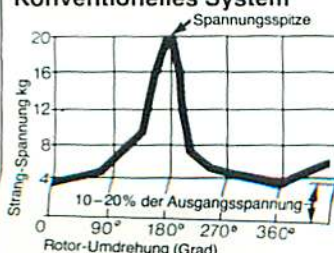
Die drehbare, unter Federspannung gehaltene Kompensationsplatte gleicht den Überschuss an Garn oder Draht bei der Klöppelbewegung über die innere Rotorhälfte aus. Die niedrigste Auslaufspannung ist niemals geringer als 60% der Spannungsspitze.

Je nach Material werden in den Klöppelkopf verschiedene Federn eingesetzt. Sie decken einen Spannungsbereich von 1,8 bis 13,5 kg ab.

MR-11



Konventionelles System



Produktiv

225 Rotor-Umdrehungen pro Minute
beim Einsatz von Draht auf 9-kg-Spulen.

235 Rotor-Umdrehungen pro Minute
beim Einsatz von Garn auf 3,1-kg-Spulen.

Diese Geschwindigkeit wird auch mit problematischen Garnen erreicht.

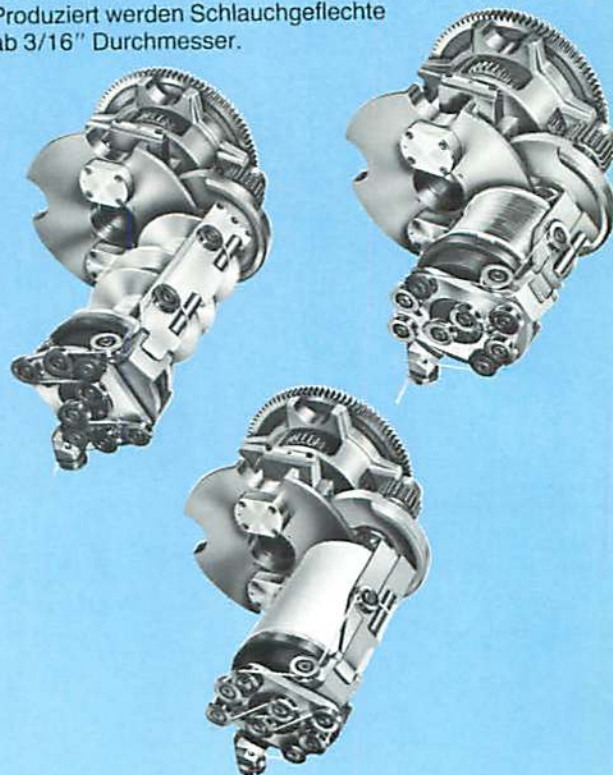
Vielseitig

Die MR-11 Braidmatic arbeitet nach dem Maypole-Prinzip.

Das Flechtmuster folgt der Regel „unter zwei, über zwei“.

Die Maschine wird mit 16, 20 oder 24 Klöppeln hergestellt.

Produziert werden Schlauchgeflechte
ab 3/16" Durchmesser.



Einfach und sicher

- Automatische Zentralschmierung
- Gleicher Klöppel und Klöppelkopf für Garn und Draht
- Klöppelköpfe sind vor der Produktion einstellbar
- Minimaler Wartungsaufwand an Klöppeln und Klöppelköpfen
- Geringe Flaumbildung bei Garneinsatz durch Rollen an den Umlenkstellen.

Zuverlässig und betriebssicher

- Alle Teile sind tauschbar
- **Gehärtete und geschliffene Zahnräder** und Wellen
- Alle rotierenden Teile sind rollengelagert
- Elektronische Sicherheitseinrichtung und Abschalt-Automatik

MR-11 Braidmatic schafft Qualität zu geringeren Kosten

Technische Daten

Nach US-amerikanischem Maßstab entstehen bei der Produktion im herkömmlichen System und mit der MR-11 Braidmatic die dargestellten Kostengrößen. Gegenübergestellt sind die Betriebskosten eines konventionellen 7"-Systems und einer 11"-MR-11 Braidmatic. Die Kosten sind bezogen auf U.S. Cents pro laufenden Meter.

Herkömmliches System 7"
24 Klöppel 12,55

Spulenwechsel 5,74

Klöppel-Instandhaltung 4,76

Energie 1,08

Raum 0,54

Ersatzteil-Lager 0,43

MR-11 Braidmatic 11"
24 Klöppel 3,24

Spulenwechsel 1,15

Klöppel-Instandhaltung 0,98

Energie 0,75

Raum 0,33

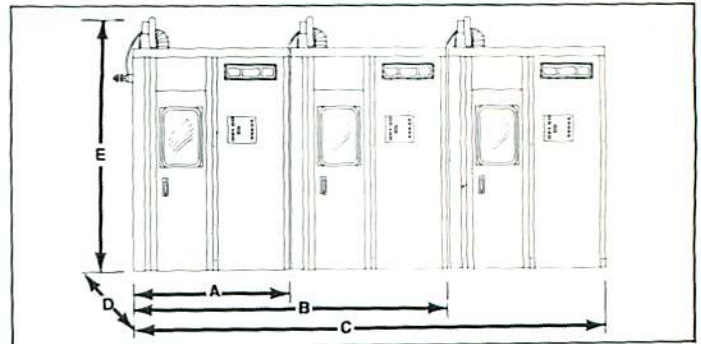
Ersatzteil-Lager 0,03

Flechtkopf		16 und 20 Klöppel	24 Klöppel	Abzugs- raupe
Länge	mm	2010	2010	1422
Breite	mm	1600	1630	762
Höhe	mm	1983	2103	1143
Gewicht	kg	1535 (16 Klöppel) 1970 (20 Klöppel)	2400	
Rotorgeschwindigkeit				
Garn U/min.		235	235	
Draht U/min.		225	225	
Spulengrößen				
Garn		1600 cm ³	1600 cm ³	
Draht		9,0 kg	9,0 kg	

Montagebedingungen

Fundament 25 cm stahlarmierter Beton
Elektrische Ausführung Nach Kundenwunsch
Zuleitung 6 ϕ , Verteiler mit 50 Amp.-
Sicherung

Kabinen-Maße		mm
Einfachkabine	A	2135
Doppelkabine	B	4103
Dreifachkabine	C	6236
Tiefe	D	1929
Höhe	E	3022



Die MR-11 Braidmatic wird im metrischen System gebaut.
Entsprechend problemlos ist die Ersatzteilbeschaffung.

Alle genannten Daten sind naturgemäß abhängig von den jeweils
gegebenen Betriebsbedingungen, vom geforderten Produkt,
dem eingesetzten Material und dem Zustand der Maschine.



**Mayer, Rothkopf Industries
Inc.**, P.O. Drawer 1466
Orangeburg S.C. 29115, USA
Telefon (803) 536-3500
Telex 573-894



Für Europa: Mayer & Cie.
Postfach 1580
D-7470 Albstadt-2
Telefon (07432) 19-1
Telex 0763894



Basle 5/80

The MR 11 Braidmatic maypole braider is running over two years in several plants in the U.S.A. at the full satisfaction of our clients. Comparing the MR 11 with currently used braiders used for the reinforcement of hydraulic hoses, steam hoses, mining hoses, and discharge hoses has shown that :

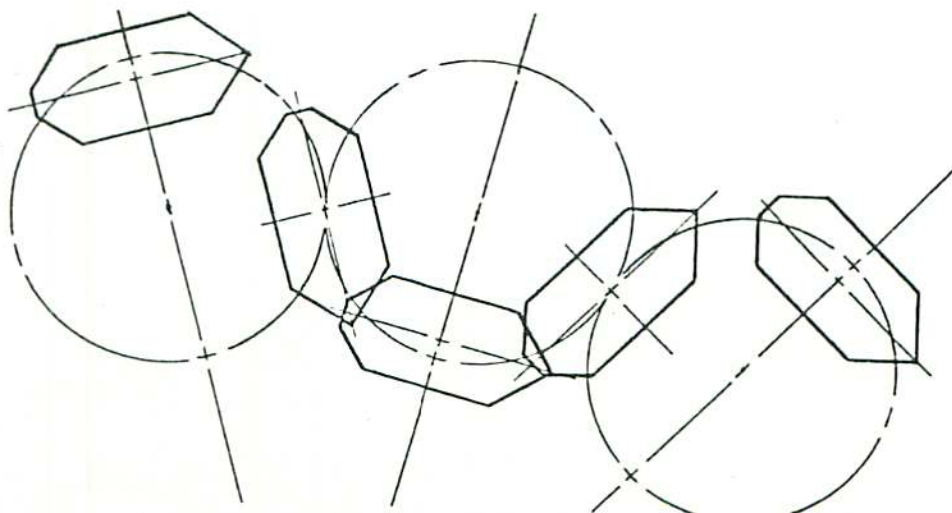
1. The braid is very even over the total length of the hose.
2. Maintenance cost for carriers and the machine are extremely low. Generally speaking, it has been shown that these costs are 60 % below currently experienced costs. Per braider deck this alone represents a savings of approximately US C 0.5 per foot of hose. In the case of three decks per machine, this savings increases threefold per foot of hose.
3. Energy costs per foot of hose for operating the deck are 50 % lower than what is currently experienced with other braiders. This represents a savings of US C 0.07 per deck/foot of hose.
4. For the braiding of yarn the speed of the rotor can be increased to 235 RPM. The lowest tension at which yarn was braided amounted to 3.5 lbs.

All in all, it can be said that the MR 11 has proven itself. Plants in the U.S.A., and Europe, have selected the MR 11 over competitive models.

The MR 11 principle was conceived and patented by an engineer with 20 years of braiding experience and the manufacturer of braiders. The concept was then developed into a precision machine with the experience and know-how of the Mayer Group of companies and its company in the U.S.A., Mayer Rothkopf Industries, Inc. (MRI).

Currently used braiding machines show the following characteristics :

1. Angular Acceleration of the Shuttle





The shuttle changes direction constantly at varying speeds if looked at it from the hose, because of this the eyelet changes its position to the hose constantly swinging forward and backward all the time. With the eyelet goes the wire which is constantly swung forward and backward. Thus the eyelet causes undesirable forming and jerking of the wire (abrasion in the case of yarn).

2. Crossing of open Junction

When transferring the shuttle from one rotor to the next the shuttle has to cross open space. This is done with the help of several supporting elements which are subjected to frequent maintenance costs.

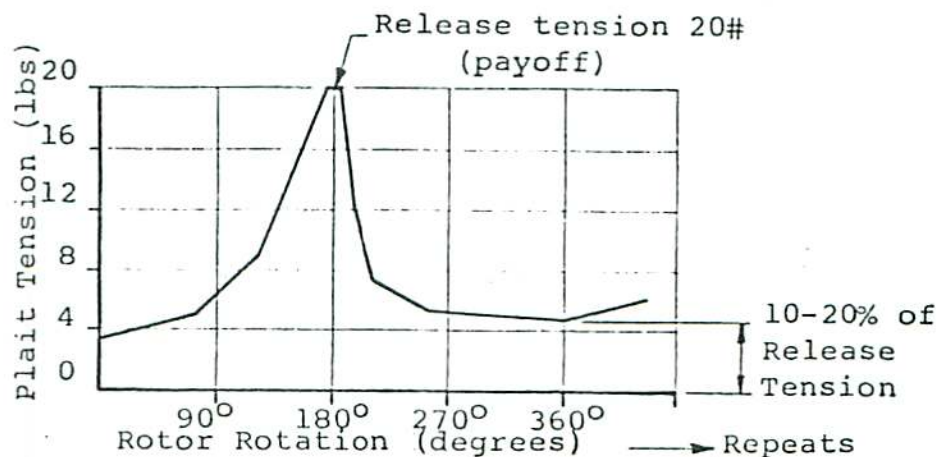
3. Wear of Parts because of Sliding Friction

The shuttle slides on the deck plate. Because of the speed and the weight the deck plate and the shuttle wears out despite the usage of large amounts of lubrication oil. The energy consumption is substantially increased to overcome the friction caused by the sliding movements.

4. Compensation of Yarn and Wire

The wire or yarn differential between the inner and outer position is compensated by contraction and extension of the loop. The tension on the wire or yarn is achieved by springs.

Due to inherent weaknesses of this system, the tension on the wire or yarn during a complete cycle changes from low rapidly to high and rapidly to low again. Due to more or less friction from one carrier to the other, and due to more or less wire on the bobbins the tension differs from one case to the other. The general tension pattern reads as follows:





At certain points during the cycle the wire is under very low tension. Combined with the forward and backward swinging of the eyelet, the wire crosses each other at these low tensions, causing cross overs.

The differential of tension also causes unevenness of the hose over its total length. The tension changes during the cycle, from empty to full bobbin, from one carrier to the other.

5. Lint Development on Yarn

The eyelet causes abrasion of the yarn, building lint and damaging the yarn surface because of the constant forward and backward swinging of the eyelet in relation to the hose.

6. Telescoping or sloughing of the Yarn Package

Because of the angular acceleration of the shuttle from one direction into the other, the outer side of the yarn package travels at faster speed than the tube and wants to continue into its original direction when the tube changes direction already. This causes the telescoping or sloughing of the yarn package close to the tube because the yarn wants to give way to these forces.

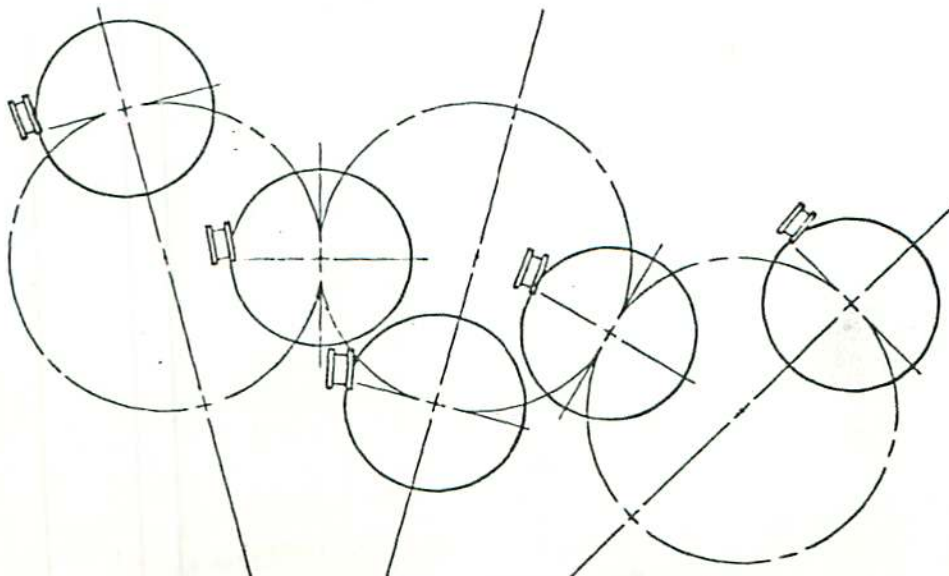
7. Energy Consumption and Lubrication

Since all moving parts slide, rather than roll, a lot of friction is generated which requires lots of energy and lubrication oils to overcome this friction.

These sliding parts require constant repair and lubrication. The lubrication oils in turn soil the braiding area.

The MR 11 Braidmatic system eliminates these problems which are characteristic to other braiders :

1. Angular Acceleration of the Shuttle



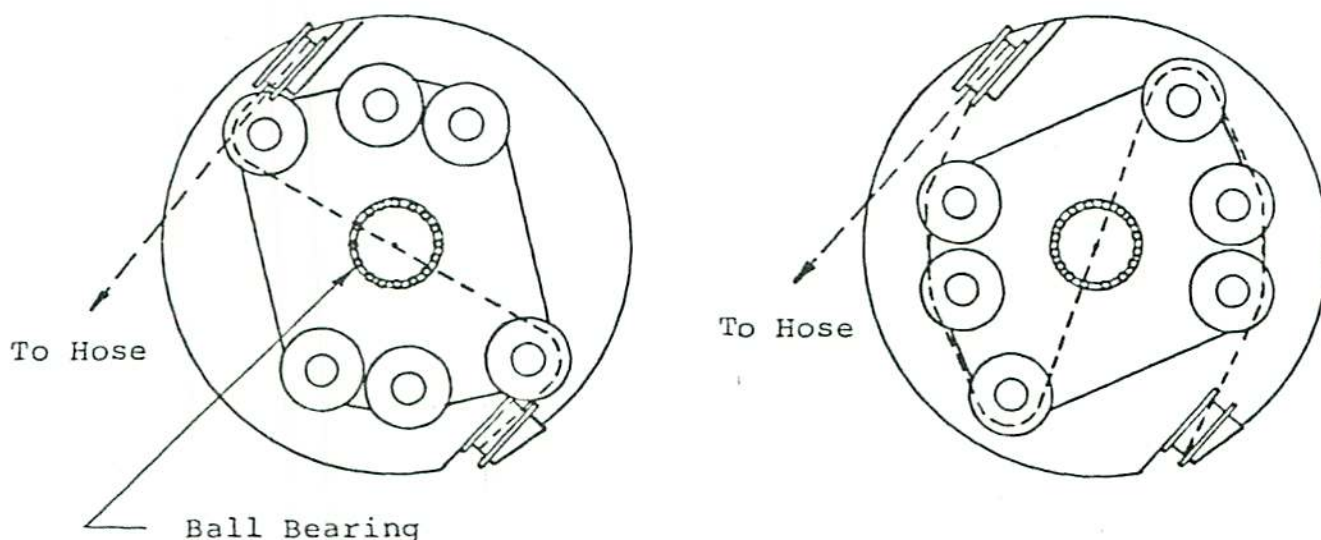


3. Wear of Parts

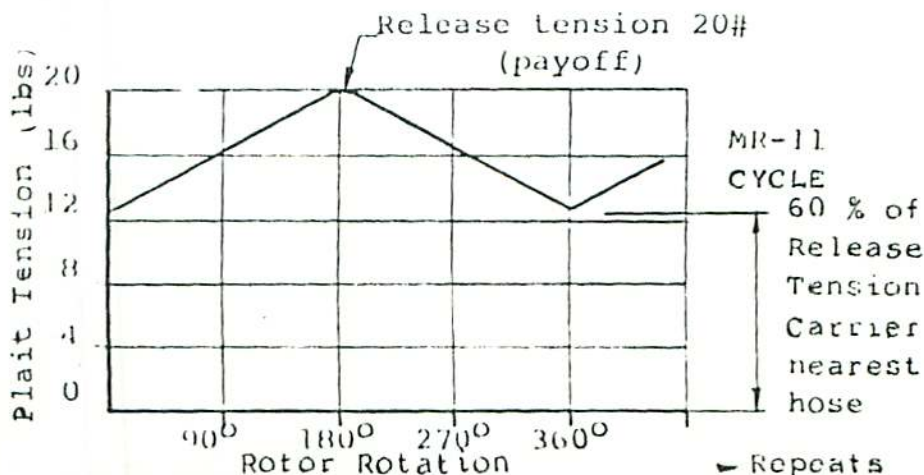
As already mentioned, the shuttle see only rolling movements causing lowest possible friction and wear on the parts. After 10,000 hours of operation at full loads (20 lbs. bobbins 24 hours) the tracks and rollers show no wear, only polished surfaces.

4. Compensation of Wire and Yarn

The wire or yarn are compensated by rotational movement of a compensator plate. This plate turns while the front and payoff roller stay fixed. The turning of the plate depends on the position of the carrier in the cycle.



The compensator plate is connected to a torsion spring. This torsion spring produces the tension. The tension on the wire or yarn results from the torque of the spring. The tension during the cycle reads as follows :





The tension increases and decreases gradually. Even at the lowest point the tension is still about 60 % of the payoff tension.

Because of this near constant tension, the wires are held in their position, and because the payoff roller does not change its direction to the hose the wires have less chance to cross over.

The torque of the spring can be changed by turning the adjusting ring of the carrier. Doing this changes the torque of the spring and, therefore, changes the payoff tension. The torque of the spring can be measured by a micrometer, is adjustable and allows the setting of all carriers to read the same torque and, therefore, the same payoff tension from one carrier to the other. All carriers having the same tension keeps the hose right in center since all forces equalize each other.

Very important is the ability to reproduce a braid because the tension can be adjusted properly to any desired level.

5. Lint Development on Yarn

The yarn sees no abrasion during the braiding process because it is guided over rollers, no eyelets. The only lint that can develop results from the tension at which the yarn is being braided. The more tension on the yarn the more lint may develop. Please also notice that the carrier for yarn or wire are the same.

6. Telescoping or Sloughing of the Yarn Package

The planetary gear eliminates any angular acceleration. Therefore, the outer side of the yarn package is not reversed at the rate as is experienced with other braiders.

The tube is not pressed into a retainer, tube has a slot which fits into a key. Plastic or specially prepared tubes can be reused in the case of the MR 11.

The yarn package of the MR 11 is 80 % larger than the largest package used by other braiders. The total volume of the yarn amounts to 250 cubic inches or 4,096 cubic centimeters. The wire capacity for the wire bobbin is 20 lbs.

7. Energy Consumption and Lubrication

The MR 11 is equipped with an automatic lubrication system. The oil is recycled after passing through three settling tanks. All moving parts are behind an inner shield. The shield features profiles allowing the excess oil to collect and run back into the settling tanks without coming into the braiding area. Like this your braiding area sees no oil and remains clean and dry.



The fully set up MR 11 can be turned by hand. This is because the sliding friction is eliminated. Hence very low energy consumption. Per braiding head the energy consumption is 3 HP less than a similar braider running at 225 RPM.

We are manufacturing the MR 11 in three different sizes, as follows:

16 Carriers 225 RPM with wire / 235 RPM with yarn

20 Carriers 225 RPM with wire / 235 RPM with yarn

24 Carriers 225 RPM with wire / 235 RPM with yarn.

For larger hoses we suggest the double bobbin system which equals a 48 carrier braider.

Our testmachine in the U.S.A. or Germany will be at your disposal for testing and viewing.



The MR 11 principle eliminates the angular acceleration with the help of planetary gears which compensate these angular movements and provide for a constant position of the pay-off roller towards the hose. The wire or yarn runs directly to the hose, no forward or backward swinging.

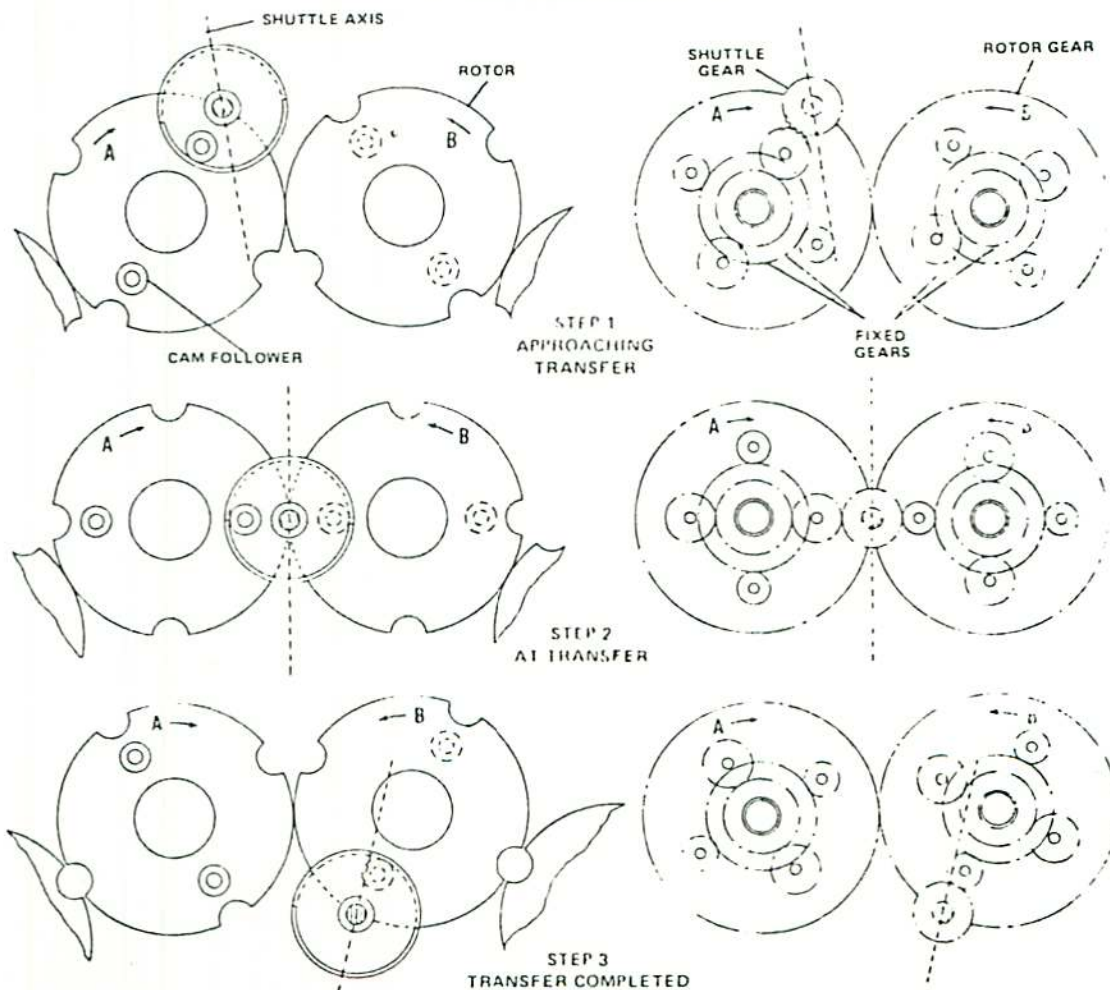
2. Crossing of Open Junction

The MR 11 has no deck plates. The open junctions are eliminated. The shuttle sees a perfect transfer when moved from one rotor to the next.

The shuttle is held by rollers, mounted to the rotor which run in cam-tracks fixed to the shuttle and thus avoid that the shuttle is thrown out of this cycle. It is very much like the arms of the partners locking into each other during the maypole dance.

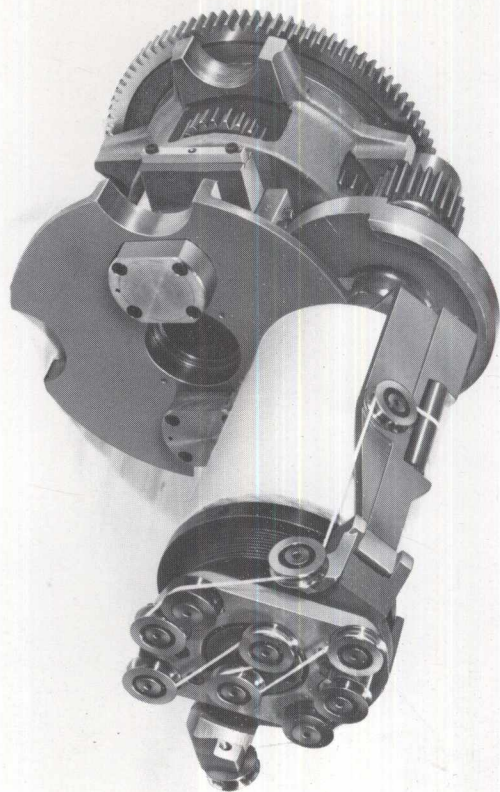
Since the rollers run on tracks the movement is a rolling moving, no sliding friction. Just like wheels running on tracks in the case of the railways.

SHUTTLE TRANSFER



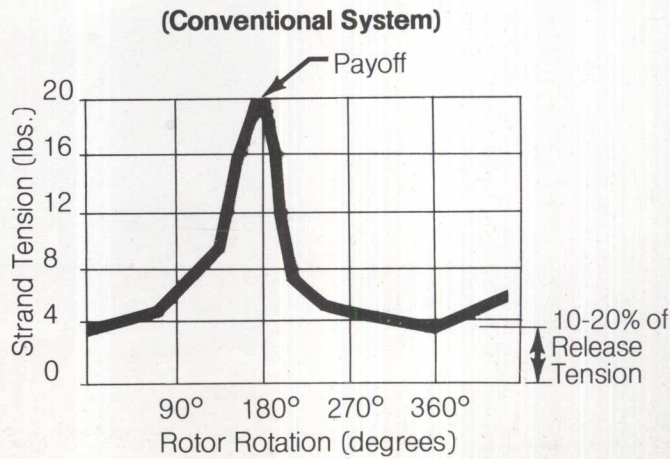
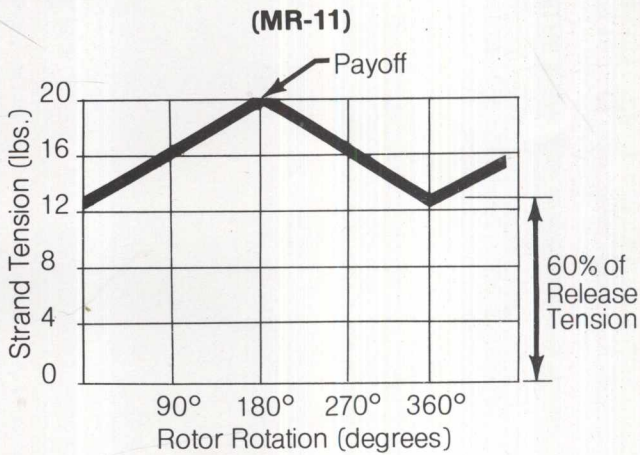
No Sliding Friction

All moving surfaces are protected by roller bearings. This means less wear and less downtime for maintenance. The effortless movement of all shuttles reduce energy consumption drastically.



Tension Control

The slack between inner and outer cycle is stored by turning the compensator plate. The compensator plate is under tension. As the plate turns the tension increases or decreases gradually. However, the tension at its lowest point is never less than 60% of the release tension at the payoff position. Three types of springs cover a tension range from 3.5 to 30 pounds (1.8 to 13.5 kilos).



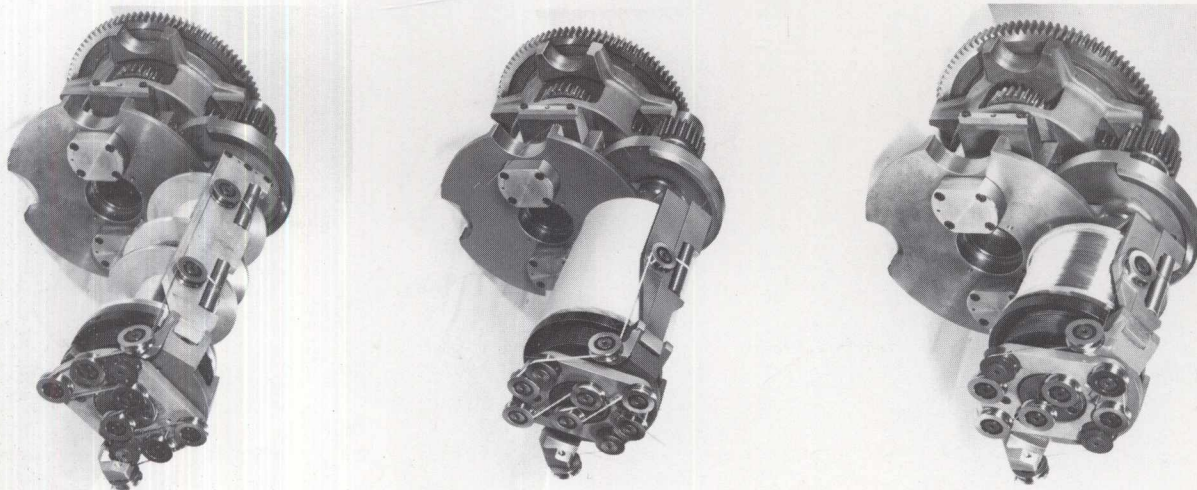
Productivity

225 Rotor RPM for wire with 20 pound bobbin (9.0 kilos)

235 Rotor RPM for yarn with 7 pound package (3.1 kilos) **even in the case of difficult yarns**

Versatility

The MR-11 is a Maypole Braider which produces a braid pattern under two over two. It is manufactured in 16, 20, and 24 carrier decks capable for reinforcing hose from 3/16" and larger diameter (depending on coverage).



Simplicity

- Automatic lubrication system
- Same carrier for yarn and wire
- Carrier settings can be made prior to operation
- Minimum carrier maintenance
- Minimal lint development due to rolling surface contacts

Reliability

- Full interchangeability of parts
- Hardened and ground gears and shafts
- Roller bearings on all moving parts
- Electronic sensing devices for operator protection and machine malfunction

MRI think\$ROI productivity, versatility, simplicity, reliability...Return On Investment!

The MR-11 Braidmatic® System Gives You:

productivity, versatility, simplicity, reliability
...Return On Investment!

Comparable cost elements between 24 carrier Braidmatic® system in cost units per linear foot of a yarn-wire-yarn hose construction versus conventional 7" systems.

Conventional 7" 24 carrier 3.955

Bobbin Change Cost	1.75
Carrier Maintenance Parts & Labor Cost	1.45
Energy Cost	.33
Space Cost	.165
Spare Parts Inv.	.13

75% Savings With MR-11 Braidmatic®

MR-11 11" 24 carrier 1.

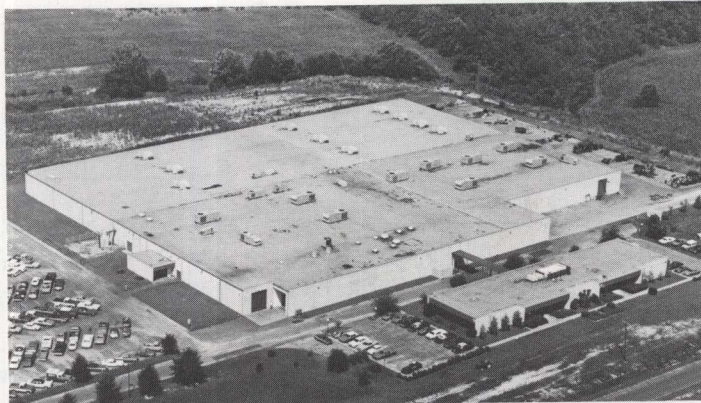
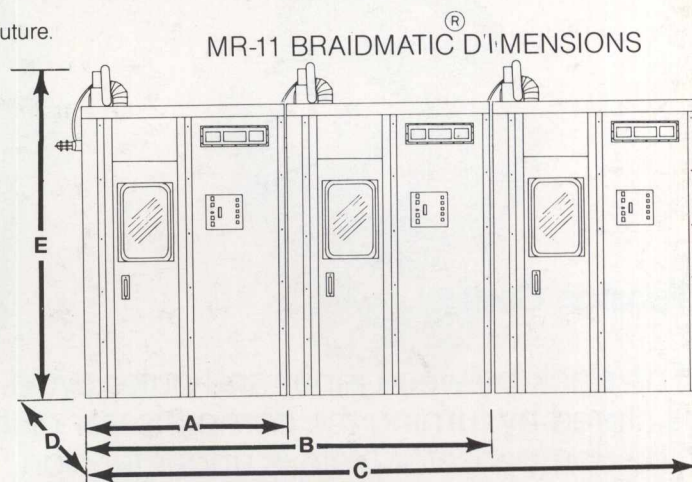
Bobbin Change Cost	.35
Carrier Maintenance Parts & Labor Cost	.3
Energy Cost	.23
Space Cost	.1
Spare Parts Inv.	.01

Estimated Production Cost Comparison Between MR-11 and Conventional Systems In U. S. Cents Per Running Foot

Specification of Deck	16 & 20 Carrier	24 Carrier	Hauloff Unit
Length	79" (2010mm)	79" (2010mm)	56" (1422mm)
Width	63" (1600mm)	64" (1630mm)	30" (762mm)
Height	78" (1983mm)	83" (2103mm)	45" (1143mm)
Weight	3,380 lb. - 16 Carrier 4,340 lb. - 20 Carrier	5300lb (2409 kilo)	—
Speed Yarn	235 Rotor RPM	235 Rotor RPM	—
Speed Wire	225 Rotor RPM	225 Rotor RPM	—
Package Size Yarn	250 cu.in. (1721 cu.cm.)	Same	—
Package Size Wire	20 lb. (9.0 kilos)	Same	—
Plant Requirements			
Floor Construction	Steel Rod Reinforced Concrete, 10" Thick		
Electrical	No. 6 Wire Size To Machine From a 50A. Fused Disconnect		

Note: The MR-11 Built In The Metric System . . . The Dimension Of The Future.

Enclosure Dimensions	Inches	MM
A-Single Deck	84	2135
B-Double	161.5	4103
C-Triple	245.5	6236
D-Width	76	1929
E-Height	119	3022



Mayer, Rothkopf Industries, Inc.

MRI Headquarters (160,000 sq. ft. facility): P. O. Box 1466, Orangeburg, South Carolina 29115 USA Telephone (803) 536-3500 • Telex 573-449
European Office: Mayer & Cie, 7477 Albstadt 2, Tailfingen, W. Germany Telephone 07432-191 • Telex 763-894

ALL DATA DEPENDS ON TYPE OF HOSE PRODUCED, TYPE OF WIRE
AND YARN PROCESSED, MACHINE CONDITION AND MILL ENVIRONMENT